

Chapter 18



Jen Lewin: Henrietta Lacks and the Importance of Medical Ethics

Jen Lewin is a middle school teacher in the Chicago Public Schools. She works at John C. Coonley Elementary in the North Center neighborhood. She loves her job. To work with some of the most talented students in the city and stay a forever student herself is a good motivator. She quite possibly learns more from them than they do from her. Having lived in Chicago for almost two decades, Jen will never tire of the endless culinary options here in the windy city. She has a Bachelors of Science in Biology from Loyola University Chicago and a Masters of Education from DePaul University Chicago.

Henrietta Lacks and the Importance of Medical Ethics

Grade Level: 7th Grade

Content Area Topic: Biology

Content Area Standard(s):

- All living things are composed of microscopic units called cells (LS1.A)
- New technologies increase some risks and decrease others. Some of the same technologies that have improved the length and quality of life for many people have also brought new risks (ETS2.B)
- Disease is a breakdown in structures and functions of organisms (LS1.A)
- Diseases can be caused by the environment, genes, viruses, and lifestyle (LS1.A)
- Mutations can be helpful, harmful, or neutral in how they affect an organism
- Technologies having to do with food production, sanitation, and health care have dramatically changed how people live and work and have resulted in rapid increases in the human population (ETS2.B)

Learning Objective(s):

- To analyze the importance of medical ethics in cell analysis
- To explore how citizen science can help contribute to medical breakthroughs
- To research various forms of cancer
- To identify misconceptions related to cancer cells and normal cells
- To compare and contrast different forms of cancer in the female reproductive system

Possible Misconceptions:

- All cancer comes from the same type of cell
- The difference between malignant and benign cells
- Cells are two dimensional
- Certain characteristics are always inherited by the mother and some by the father
- Different cell types contain different DNA

Suggested Time Allotment:

2-3 Class periods (at least 60 min each)

Sequence in Learning:

This lesson can be taught during the Cell Biology unit recommended by the Chicago Public Schools Department of Science. Although I use the Lab-Aids SEPUP Curriculum, this lesson is intended to supplement the lessons where students study the germ theory of disease, cell structure and function, and how human research is conducted. Genetics can be incorporated before or after the unit.

Requisite Knowledge

- Student knowledge of microscopy and cell parts,
- Teacher knowledge of histology and HIPAA (see resources)

Materials & Resources Needed:

- <https://www.zooniverse.org/project/cellslider>
- *The Immortal Life of Henrietta Lacks* by Rebecca Skloot
- Malignant Cell Tissue Set from Carolina Biological
- Computer access
- Data sheets (attached)

Lesson Activities & Sequence:

Engage:

- Teacher will read the section of prologue from *The Immortal Life of Henrietta Lacks* where the author talks about seeing pictures of the cells for the first time (p. 2, starting at the first full paragraph to the last full paragraph on p. 5)
- Students will discuss why Rebecca Skloot's biology instructor chose to use the HeLa cells as a model for mitosis, why the HeLa cells were so important to the advancement of science, and Rebecca Skloot's mission to study the affect on Henrietta's family.
- Students will read Chapter 6 where Rebecca Skloot attempts to contact the family about Henrietta's cells.
- Teacher will share with students a recent news article about development in the HeLa cell saga (NIH web link), emphasizing how long it took for the NIH to come to an agreement about how the family's wishes would be taken into consideration when continuing research with the cells
- Students will take part in a class discussion of what life was like during the time where Henrietta Lacks was getting treatment

Explore:

- Students will read about how cervical cancer grows (p. 28 from the first full paragraph to p. 33 end)

- Students will discuss how the cancer is categorized and how doctors prepared to take excise the cancer
- Students will discuss the “consent” that Henrietta signed
- Students will view the various cancer cell samples from the malignant slides set
- Students will focus on cancers of the female reproductive system, making comparisons between the different types of cells
- Students will practice using Cell Slider

Explain:

- Teacher will walk students through Cell Slider tutorial
- Students will discuss how citizen science can help diagnose cancer cells while simultaneously respecting patient privacy
- Students will reflect about how the cells they viewed are similar/different to the cells on cell slider

Elaborate:

Students will share their individual experiences about using cell slider

Evaluate:

Students will research ovarian and breast cancer. Using their research and knowledge from the activity, they will create a project from the choice board (see supporting documents).

Differentiation:

Use of graphic organizers to assist with lab journaling give students prompts to work on labs more independently, provide a visual space or organization and note-taking, provide

Use of computer interactives for learners of various levels

Varying levels of questioning to assess students across a variety of learning styles

Proficiency:

Rubric for final choice project under “Evaluate” in 5E lesson (see attached)

Data sheets to assess group work and understanding

Students should walk away knowing that science benefitted in many way from Henrietta’s misfortune. As a society, it is our obligation to recognize that injustice and make sure we do not repeat those same mistakes. The priority for the lesson and assessment should lie with:

- Cell Structure
- Medical Ethics
- Medical Research Techniques
- Citizen Science Tools for Research Advancement

Feedback

Teachers As Learners:

Lesson was authentic (using real malignant cell samples, use of personal biography representing injustice, teacher created) and engaging (had the group's attention from the start)

Bringing literature into the lesson was a great hook (used Henrietta Lacks biography)

Powerful way to discuss several controversial topics (racism, women's & civil rights, patient privacy rights) in a meaningful lesson

Elements of Pretty Good Practice:

Beginning of lesson ... using a real life story was a great launch for the lesson. The level of engagement was maintained throughout the lesson

Exploratory – use of online cell slider (citizen science, computer modeling)

Modifications and Adaptations:

- Include graphic organizer for student to complete during lesson
- Include prompt for student reflections to capture student discussion during the lesson
- Find additional websites to learn more about cells, cancer research, etc.
- Connect to study of related careers

Questions Arisen:

Do students have their own computers when doing this lesson?

Bibliography:

Skloot, R. (2010). *The Immortal Life of Henrietta Lacks*. New York, NY: Crown.

Related Resources/Ideas:

- <http://rebeccaskloot.com/the-immortal-life/teaching/> (resources from the author's website)
- <http://www.hhs.gov/ocr/privacy/> (background on HIPAA)
- <http://www.histology-world.com/contents/contents.htm> (background on histology)
- <http://htwins.net/scale/> (micro to macro scale interactive)

Pathologist Name: _____
Analyzed: _____

Date Sample

Purpose:

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Malignant cell observations (focus on female reproductive system slides, but you are welcome to observe the other cell slides if you finish early):



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Draw and describe what you are seeing on each slide, taking care to label and diagram each drawing.

Are there any cell parts you have studied that you can identify?

Cell Slider Interactive:

Did you find it easy or difficult to identify the cell types in each example? Explain your answer.

Why is this research valuable and how does the citizen science project assist this research?

Discussion:

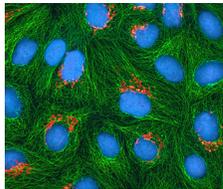
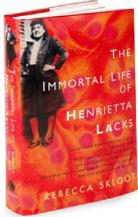
What were some of the similarities and differences you and your group observed between the cells you were asked to identify in Cell Slider? Create a t-chart below to highlight some key factors.

Were the slides you observed in the lab similar or different to what you observed in Cell Slider? Explain.

What would be important skills for a doctor and a pathologist to have in order to properly diagnose cancer cells?

What scientific tools or technology allow us to diagnose malignant cells?

Henrietta Lacks and Her Living Legacy



What are some key issues that were identified when discussing Henrietta's tissue samples?

Was Henrietta respected as an individual? List key factors that support your ideas.

Imagine that you or a family member were faced with a similar situation. How might you react? Would you have concerns? Would you want your cells used for research? What sort of privacy would you expect from the doctor or hospital?

How has Henrietta's case shaped how medicine works today?

Choice Board for Public Awareness Campaign

 <p>Grant proposal for research (i.e. genetic, cancer, better technology)</p>	 <p>Write a politician</p>	 <p>Documentary about a patient's life</p>
 <p>Public Service Announcement</p>	<p>Your goal is to raise awareness about patient rights and disease research. Choose one of the following project ideas that you feel you could use to send the best message. Use the rubric to verify you have included all components for a quality project.</p>	 <p>Fundraiser proposal (walk-a-thon, bake sale)</p>
 <p>News segment on the local news</p>	 <p>Pamphlet for doctors' offices to provide patient information</p>	 <p>Create your own idea! This should be detailed as the other project ideas are and approved by me. Come up with a proposal about how you would spread the word.</p>

Public Awareness Campaign : Using the Past to Inform the Future

Teacher Name: **Lewin**

Student Name: _____

Category	4	3	2	1
Research/ Statistical Data	Students include 4 or more high-quality examples or pieces of data to support their campaign.	Students include at least 3 high-quality examples or pieces of data to support their campaign.	Students include at least 2 high-quality examples or pieces of data to support their campaign.	Students include fewer than 2 high-quality examples or pieces of data to support their campaign.
Cam- paign/ Product	Students create an original, accurate and interesting product that adequately addresses the issue.	Students create an accurate product that adequately addresses the issue.	Students create an accurate product but it does not adequately address the issue.	The product is not accurate.
Internet Usage	Successfully uses suggested internet links to find information and navigates within these sites easily without assistance.	Usually able to use suggested internet links to find information and navigates within these sites easily without assistance.	Occasion-ally able to use suggested internet links to find information and navigates without as-sistance.	Needs assistance or supervision to use suggested internet links and/or to navigate within these sites.

Scientific Concepts	Report illustrates an accurate and thorough understanding of scientific concepts underlying the project.	Report illustrates an accurate understanding of most scientific concepts underlying the project.	Report illustrates a limited understanding of scientific concepts underlying the project.	Report illustrates inaccurate understanding of scientific concepts underlying the project.
Sources of Information	All sources (information and graphics) are accurately documented in the desired format.	All sources (information and graphics) are accurately documented, but a few are not in the desired format.	All sources (information and graphics) are accurately documented, but many are not in the desired format.	Some sources are not accurately documented.